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REMARKS

SECTION 102 REJECTION

Applicant acknowledges withdrawal of the section 102 rejection based on *Cooper*.

SECTION 101 REJECTION

The Examiner's remarks suggest that the section 101 rejection is made for two distinct reasons:

(1)   Because the claims allegedly recite an abstract idea; and

(2)   Because the claims recite steps that need not be performed by a machine.

Claims recite a practical application as required by *State Street*[1]

With regard to the first reason, the Examiner cites *State Street* as standing for the proposition that a claim is statutory if it recites a practical application.

In *State Street*, the claim at issue recited a method for evaluating a share price. The Court held that this resulted in a practical application, namely "a final share price momentarily fixed for recording and reporting purposes and relied upon by regulatory authorities in subsequent trades."

Applicant's claim 1 recites a method that includes evaluation of both a "competing-algorithm score" and an "incumbent-algorithm score." Like the share price in *State Street*, these scores are numerical indications of value. The only difference lies in what is being valued.

In particular, the share price of *State Street* indicates the value of a business, i.e. the perceived effectiveness at which the business performs. This perceived effectiveness, as represented by the share price, is used in, among other things, evaluating which of several competing businesses one might choose to invest in.

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[1] *State Street Bank & Trust v. Signature Financial Group*, 149 F3d 1368 (Fed. Cir. 1998).

Similarly, the two scores recited in the claim indicate the values of two different algorithms: the "incumbent algorithm" and the "competing algorithm." These scores represent perceived effectiveness of these algorithms. Just as the *State Street* share value is used to decide which business to invest in, the claimed scores are used to decide which algorithm to execute.

It is apparent that both the share price calculated in *State Street* and the algorithm scores evaluated in claim 1 represent values that are used to carry out decisions having tangible consequences. A correct decisions based on the value of a share can result in tangible profits. Similarly, a correct decision based on the performance of an algorithm can result in a direct and tangible effect on the operation of computer hardware. As just one example, choosing an algorithm that correctly anticipates what data to cache in memory can drastically reduce disk head activity by reducing disk I/O activity. This results in decreased wear of mechanical parts, reduced latency, and reduced power consumption, all of which are at least as tangible, if not more so, than the profits that might result from applying the method of *State Street*.

State Street clearly stands for the proposition that calculating a number representative of value, which can be used to make decisions, is patentable subject matter. Nowhere does *State Street* require that the value be a share value. Therefore, evaluating a value, i.e. a score, as recited in the claims, in comfortably within the ~~brands~~ bounds of statutory subject matter.

On page 4 of the Office Action, the Examiner states that although the claims recite methods for causing a computer to carry out certain tasks,

> "the steps...claimed in the claims can be provided with instruction code and until these instruction code are specifically stored on a physical storage device and specifically executed by a processor, these instruction code are mere non-functional descriptive data, which renders the claims non-statutory."

As best understood, the Examiner asserts that:

1.   The claimed steps can be carried out by computer-readable code.

2.   This code describes the method.

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3. Therefore, this code is non-functional descriptive data.

Applicant fails to see the relevance of this line of reasoning. Claim 1 recites a method; it does not recite computer-readable code.

Accordingly, there appears to be no basis for the Examiner's rejection of claim 1 as reciting abstract, and hence non-statutory, subject matter. Claims 2-9, all of which depend on claim 1 likewise recite statutory subject matter.

Independent claims 10 and 14 and all claims dependent thereon likewise recite statutory subject for reasons discussed above in connection with claim 1.

Statutory subject matter does not depend on steps being carried out by machine
On page 6 of both the previous and present Office Actions, the Examiner states that

"the Office's interpretation of [the claims] is that these claims do not expressly or implicitly require performance of any steps by a machine, such as a general purpose digital computer. Structure will not be read into the Claims for the purposes of the statutory subject matter analysis although all the steps might be capable of being performed by a machine."

On the other hand, on page 4 of the present Office Action, the Examiner

"respectfully notes that the previous Office action has not raised the issue of unpatentability of the claimed method because the method steps are being performed by a human being; rather, the previous Office action indicates that under the most recent Federal Circuit cases, the transformation of data by a machine...is statutory subject matter provided the claims recite a "practical application..."

Thus, the Office Action appears to contain a contradiction. Until this contradiction is resolved, Applicant cannot meaningfully reply to this aspect of the section 101 rejection.

SECTION 112 REJECTIONS (WRITTEN DESCRIPTION)
Claims 1 and 16: "score indicative of performance"
These claims recite the limitation of "evaluating an incumbent-algorithm score indicative of an actual performance of an incumbent algorithm."

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The Examiner suggests that one of ordinary skill in the art would not know what is meant by "a score indicative of performance." In particular, one of ordinary skill would not know whether the score is "a number or a percentage, of how accurate or how fast an algorithm is."[2]

It is quite clear from the following passage in the specification:

> The output data can include data indicative of an extent to which the competing-algorithm score **32a-c** exceeds the incumbent-algorithm score **26** and how consistently the competing-algorithm score **32a-c** exceeds the incumbent-algorithm score **26**.[3]

that the "score indicative of performance" must be a number. After all, if the score were not a number, it would be meaningless to say that one score "exceeds" another. Thus, one of ordinary skill reading this passage would immediately see that the two scores must be numbers since if they were anything but numbers, the foregoing passage would make little sense.

Claims 6 and 21: "obtaining meta-data…"

These claims recite the limitation of "obtaining meta-data characterizing an input data-stream."

The Examiner appears to be suggesting that one of ordinary skill would not understand the meaning of "meta-data."

The specification describes meta-data as follows:

> "Meta-data refers to data that characterizes the input data-stream **22**. For example, meta-data might refer to the number of requests for data stored within a particular range of locations. In effect, meta-data is data that is used to statistically characterize the input data-stream **22**."[4]

It is unclear why one of ordinary skill who reads this would somehow fail to understand what "meta-data" means.

The Examiner also appears to suggest that one of ordinary skill would not know what it means for meta-data to "characterize" an input-data stream.

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[2] *Office Action*, page 7.
[3] *Specification*, page 7, lines 20-23.
[4] *Specification*, page 6, lines 29-32.

Certainly one of ordinary skill would know what it means to "characterize" something. The phrase "input data stream" is clearly described by the text

"an incumbent-algorithm process **20** receives data in an input data-stream **22**"[5]

as being what the incumbent-algorithm receives.

It is unclear why one of ordinary skill would have any difficulty understanding the meaning of a phrase formed by joining a known verb "characterizing" with a known object "input data-stream" to form the phrase "characterizing an input data-stream".

The Examiner has also raised certain questions concerning the meaning of "live, non-stationary random process."

As the Examiner correctly infers, the term "live" means "real time," or as close to real time as possible given inherent processing delays. The term "live" is used in the same sense as "live" radio and television broadcasts. The input data-stream thus reflects the actual requests made by users of the system as those requests are made.

The Examiner asks how the input stream can be a "process." The term "process" is well-known in the art for describing time-varying phenomena subject to random fluctuations. The term "process" is often used in such contexts as "stochastic processes" and "random processes." For example, repeatedly tossing a coin results in a Bernoulli "process" characterized by certain statistics. The randomly varying waiting time for a bus results in a Poisson "process," also characterized by certain statistics.

The term "non-stationary" is well-known for describing a stochastic process whose statistics vary with time.

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[5] *Specification*, page 6, lines 2-3.

Applicant fails to appreciate the difficulty associated with comparing one process with another simply because one or both are "random and changing." Indeed, much of the study of stochastic processes involves making such comparisons.

Claims 7 and 22: "maintaining statistics..."
These claims include the limitation of "maintaining statistics descriptive of said input-data stream during a selected interval."

As discussed above, "input data-stream" is defined in the specification. The meanings of "statistics" and "interval" are certainly well-known. It is also well-known to use statistics to describe various time-varying phenomena. Obviously, one must select some time interval during which to obtain statistics. Thus, it is not clear why the meaning of "statistics descriptive of an input data-stream during a selected interval" would be a mystery to one of ordinary skill in the art.

Claims 8 and 23: "incorporating a penalty..."
These claims recite the limitation of "incorporating a penalty into said competing algorithm score."

The concept of a penalty is described in the specification as follows:

> "In one practice of the invention, the tournament manager 36 can handicap the competing-algorithm scores 32a-c by amounts that reflect the system resources consumed in replacing the incumbent algorithm with the competing algorithm."[6]

Although the term "penalty" is not specifically used in the detailed description, the notion of somehow applying an offset to a score to compensate for an external factor is clearly disclosed. Whether that offset is called "penalty," "handicap," or "offset" simply reflects the fact that the English language is sufficiently rich to provide multiple words for the same underlying idea.

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[6] *Specification*, page 7, lines 3-5.

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Applicant notes that "[t]he subject matter of the claim need not be described literally (i.e. using the same terms of *in haec verba*) in order for the disclosure to satisfy the written description requirement."[7] Moreover, it is well-established that the originally filed claims are to be considered for purposes of evaluating compliance with the written description requirement.[8]

Claims 9. 24, 28: "selecting said penalty to be indicative of a cost..."

These claims recite the limitation of "selecting said penalty to be indicative of a cost associated with replacing said incumbent algorithm with said competing algorithm."

In the passage quoted in connection with claims 8 and 23, the text

"by amounts that reflect the system resources consumed in replacing the incumbent algorithm with the competing algorithm"[9]

clearly provides written description for this claim.

Claims 10, 15, 27: "generating meta-data characterizing an input data-stream"

Claim 10 does not recite the limitation of "generating meta-data characterizing an input data-stream." Hence, this section 112 rejection does not apply to claim 10.

Claims 15 and 27 recite the limitation of "generating meta-data characterizing an input data-stream."

Written description for both "meta-data" and "input data-stream" has already been discussed above in connection with claims 6 and 21.

Claims 10, 25: "statistically characterizing a usage pattern..."

Claims 10 and 25 recite the limitation of "statistically characterizing a usage pattern of said data-storage system."

The Examiner appears to be suggesting that one of ordinary skill would not appreciate what a "usage pattern" is.

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[7] *MPEP* 2163.02.

[8] *Union Oil of California v. Atlantic Richfield,* 208 F.3d 989 (Fed. Cir. 2000).

[9] *Specification,* page 7, lines 24-25.

Applicant submits that the meaning of "usage pattern" is clear on its face. Certainly, both "usage" and "pattern" are well understood words. The concatenation of these words simply means a pattern of usage.

Claim 14 and 29

The Examiner has included claims 14 and 29 in the list of claims rejected as lacking support in the written description. However, the Examiner does not specify specifically what limitation of these claims is believed to lack support in the description. Accordingly, Applicant cannot respond meaningfully to this section 112 rejection.

Since the rejection is incomplete, Applicant submits that the present office action fails to comply with Rule 1.104(*b*), which requires completeness of the examiner's action. Applicant therefore expects that any subsequent office action will be non-final.

Claim 15: "generating data indicative of a performance attribute'

Claim 15 recites the limitation of "generating data indicative of a performance attribute of a competing algorithm when said competing algorithm operates on a data-stream characterized by said meta-data."

The Examiner appears to suggest that one of ordinary skill would have difficulty understanding "performance attribute".

The specification describes performance attributes as follows:

"Generally, the performance attribute measures, directly or indirectly, the latency that results from application of the incumbent algorithm to the input data-stream **22**.

The choice of a performance attribute depends in part on the task to be performed. For example, if the task is to manage a cache memory, a suitable performance attribute might be a hit ratio that indicates the probability that data sought is already in the cache memory. Other performance attributes might include response time, bandwidth, and throughput."[10]

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[10] *Specification*, page 6, lines 17-23.

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Claim 17: "providing data indicative of..."

Claim 17 recites the additional limitation of "providing data indicative of a performance difference between said competing algorithm and said incumbent algorithm."

In the first place, the limitation quoted by the Examiner, namely

"providing data indicative of whether said competing algorithm is preferable,"

is absent from this claim. The actual language is

"providing data indicative of a performance difference between said competing algorithm and said incumbent algorithm."[11]

This is a significant difference because the actual language avoids any subjective element ("preferable") that might otherwise be considered vague and indefinite.

Moreover, the remarks on page 7 of the office action do not appear to describe the Examiner's basis for rejecting claim 17. Accordingly, Applicant is unable to respond meaningfully to this rejection.

Since the rejection of claim 17 is incomplete, Applicant submits that the present office action fails to comply with Rule 1.104(*b*), which requires completeness of the examiner's action. Applicant therefore expects that any subsequent office action will be non-final.

Claim 20: "evaluating a ratio..."

Claim 20 recites the limitation of "evaluating a ratio indicative of an extent to which said competing-algorithm score exceeds said incumbent algorithm score during said selected interval."

The Examiner suggests that one would wonder what expressions would be used to calculate the quotient defined by a hit ratio.

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[11] *Specification*, page 2, lines 15-17.

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The hit ratio is defined as a probability. All probabilities are by definition ratios of the size of an event divided by the size of the sample space from which the event is drawn.

In the cited passage:

"a suitable performance attribute might be a hit ratio that indicates the probability that data sought is already in the cache memory."[12]

it is quite obvious that the hit ratio is obtained by counting the number of times one requests data, counting the number of times that the data requested is in the cache, and dividing the latter by the former.

In a more familiar context, one might call a friend ten times and reach the answering machine eight of those ten times. In that case, the hit ratio would be 2/10, or 0.2, and the miss ratio would be 8/10, or 0.8.

SECTION 112 REJECTION (ENABLEMENT)
Burden of proof

In rejecting the claims based on enablement, the Examiner has made what amounts to an unsupported assertion that one of ordinary skill in the art would be unable to practice certain steps without undue experimentation. This unsupported assertion is insufficient to meet the burden of a section 112 rejection for lack of enablement.

As best understood, lack of enablement can arise from failure to meet the written description requirement, or because the Examiner doubts the truth of statements made in satisfying the written description requirement.

Because the list of claims rejected for lack of enablement is identical to that rejected for failure to meet the written description requirement, Applicant assumes that lack of enablement is predicated on a failure to meet the written description requirement.

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[12] *Specification*, page 6, lines 20-22.

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To the extent the Examiner considers the written description to have omitted material required for enablement, the Examiner is required to

"specifically identify what information is missing and why one skilled in the art could not supply the information without undue experimentation"[13]

The Examiner has listed certain claim limitations that are allegedly not enabled. However, the Examiner has not indicated why one of ordinary skill in the art could not supply the necessary information without undue experimentation. Therefore, the Examiner has not met the burden of establishing an enablement rejection as set forth by the MPEP.

Rejection of claims 1, 6, 7-10, 15-17, 20-28

The Examiner has drawn attention to passages already discussed in connection with the written description rejection of these claims. Accordingly, Applicant incorporates herein the arguments already made in connection with those rejections.

Rejection of claims 14 and 29

The Examiner has listed claims 14 and 29 as rejected for lack of enablement under section 112, but has not provided any basis for the rejection. Accordingly, Applicant cannot respond meaningfully to this rejection.

ALLOWABILITY OF CLAIMS 18-19, 26

The Examiner does not appear to have provided a basis for rejecting claims 18, 19, and 26. Accordingly, these claims are believed to be allowable.

SUMMARY

Now pending in this application are claims 1-29, of which claims 1, 10, 14, 15, 16, 25, and 29 are independent. No additional fees are believed to be due in connection with the filing of

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[13] *MPEP* 2164.04.

this response. However, to the extent fees are due, or if a refund is forthcoming, please adjust our

deposit account 06-1050 referencing attorney docket "07072-152001."

Respectfully submitted,

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